MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017

TIC3251/TDS3281 – DECISION SUPPORT SYSTEMS

(All Sections / Groups)

24th FEBRUARY 2017
3.00pm-5.00pm
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 4 pages with 5 Questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please print all your answers in the Answer Booklet provided.

Question 1

(a) Based on the Decision Support Framework by Gory and Scott-Morten, give one example for the content of each cell. (4.5 marks)

	Types of Control		
Types of Decision	**Operational Control**	**Managerial Control**	**Strategic Planning**
Structured			
Semistructured			
Unstructured			

(b) How can analytical techniques help organizations to retain competitive advantage? (3 marks)

(c) How can descriptive and predictive analytics help in pursuing prescriptive analytics? (2.5 marks)

Continued...

Question 2

(a) What issues should be considered when deciding which architecture to use in developing a data warehouse? List the FOUR most important factors. (4 marks)

(b) Student retention has become a challenging problem for decision makers in education institutions. How can predictive analytics be used to better manage student retention? (2 marks)

(c) Artificial Neural Network (ANN) can be used for both supervised and unsupervised learning. Explain how they learn in a supervised mode and in an unsupervised mode. (4 marks)

Question 3

(a) What can be the FOUR sources of data for sentiment analysis? (4 marks)

(b) How can text mining be used to ease the task of literature review? (2 marks)

(c) What are the things that help Web pages rank higher in the search engine results? List down FOUR of them. (4 marks)

Question 4

(a) Many computer games can be considered visual simulation. Explain why. (4 marks)

(b) State two production rules that can represent the knowledge of repairing your car. (4 marks)

(c) How can analytics affect restructuring of business processes? (2 marks)

Continued...

Question 5 – Case Study

Diagnosing Heart Diseases by Signal Processing

Auscultation is the science of listening to the sounds of internal body organs, in this case the heart. Skilled experts can make diagnoses using this technique. It is a noninvasive screening method of providing information about the conditions of the heart and its valves, but it is highly subjective and depends on the skills and experience of the listener. Researchers from the Department of Electrical & Electronic Engineering at Universiti Teknologi Petronas have developed an Exsys Corvid expert system, SIPMES (Signal Processing Module Integrated Expert System) to analyze digitally processed heart sound.

The system utilizes digitized heart sound algorithms to diagnose various conditions of the heart. Heart sounds are effectively acquired using a digital electronic stethoscope. The heart sounds were collected from the National Heart Institute in Kuala Lumpur and the Fatimah Ipoh Hospital in Malaysia. A total of 40 patients age 16 to 79 years old with various pathologies were used as the control group and to test the validity of the system using their abnormal heart sound samples and other patient medical data.

Their heart sounds are transmitted using a wireless link to a nearby workstation that hosts the Signal Processing Module (SPM). The SPM has the capability to segment the stored heart sounds into individual cycles and identifies the important cardiac events. The SPM data was then integrated with the Exsys Corvid knowledge automation expert system. The rules in the system use expert physician reasoning knowledge, combined with information acquired from medical journals, medical textbooks, and other noted publications on cardiovascular diseases (CVD). The system provides the diagnosis and generates a list of diseases arranged in descending order of their probability of occurrence.

SIPMES was designed to diagnose all types of cardiovascular heart diseases. The system can help general physicians diagnose heart disease at the earliest possible stages under emergency situations where expert cardiologists and advanced medical facilities are not readily available. The diagnosis made by the system has been counterchecked by senior cardiologists and the results coincide with these heart experts. A high coincidence factor of 74 percent has been achieved using SIPMES.

source: www.exsys.com

(a) List the major components involved in building SIPMES and comment on them. (2 marks)

(b) Do expert systems like SIPMES eliminate the need for human decision making? (4 marks)

(c) How often do you think that the existing expert systems, once built, should be changed? (4 marks)

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